

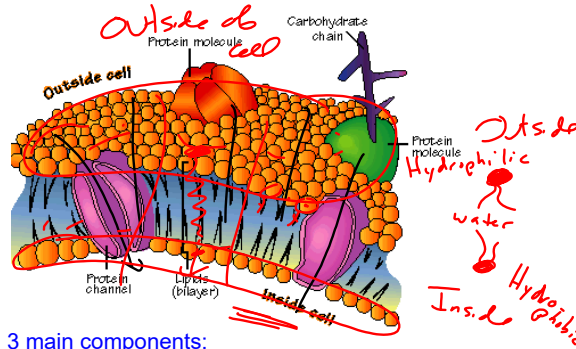
Lesson 3 Passive+active transport.notebook

<https://www.youtube.com/watch?v=S7CJ7xZOjm0>

Cell Membrane

- separates the protoplasm (inside of cell) from the nonliving environment (outside of cell - interstitial fluid)
- controls what enters and exits a cell
- semi permeable -- some material can pass through but not everything

Structure of the cell membrane (page 182)



3 main components:

- lipid bilayer -- made of fat won't dissolve
heads are hydrophilic
tails are hydrophobic
- Protein channels -- special doors or pathways
- Carbohydrate Chains -- special receptors that allow specific material to enter the cell

Passive and Active Transport (how material get in and out of a cell)

1. Passive transport

describes the movement of materials in and out of a cell without using the cells energy. This is how O_2 would get into a cell and how CO_2 would get out.

Passive transport is often compared to riding a bike down a hill -- you don't need to expend energy

There are 3 forms of passive transport:

- Diffusion - the movement of molecules from an area of high concentration to an area of low concentration
- the bigger the difference in concentration the faster the movement
- Osmosis - the movement of water from an area of high concentration to an area of low concentration

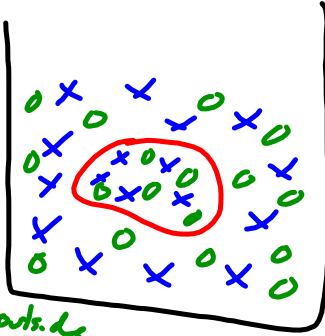
Water will move in and out of a cell based on the concentration of dissolved materials inside or outside the cell

There are 3 possible solutions a cell can be bathed in: i) isotonic soln, ii) hypotonic soln, iii) hypertonic soln.

A) Isotonic solution

concentration of
water outside
of the cell
$$= \frac{\text{water molecules outside}}{\text{total molecules outside}}$$

$$\frac{12}{24} = 50\%$$



X - water molecules
O - salt molecules

Inside

$$\frac{5 \text{ (H}_2\text{O)}}{10 \text{ (total)}}$$

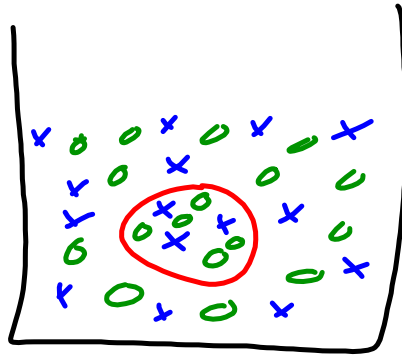
50%

Because the concentration of H₂O is the same inside and outside the cell.... there will be no net movement of water

However if 1 water molecule moves in
1 will move out to maintain an equilibrium.

B Hypotonic Solution

Concentration
of H_2O
outside
= 50%



Conc. of H_2O
inside
 $\frac{3}{8} = 37.5\%$

Water will move in.... if enough moves in,
cell could swell up and burst.

Hypertonic Solution ----you're on your own!!!


Lesson 3 Passive+active transport.notebook

C. Facilitated Transport / Facilitated Diffusion

some needed materials such as glucose are a bit too big to fit through the cell membrane like O₂ does

so instead they travel through the protein channels

once again no cellular energy is needed for this to occur

 <http://www.youtube.com/watch?v=JShwXBWGMtY>

2. Active transport

at times the cell must use some of its own energy to get things in and out

this can be compared to riding a bike up a hill...you'll get there but you'll use lots of energy.

There are 2 situations that require active transport

A. The movement of materials against the concentration gradient

In other words from a **low** concentration to a **high** concentration

The protein channels act as pumps to force materials in or out of the cell

this occurs for example in the kidney or after a nerve impulse passes along an axon

B. Active transport is also needed to move large materials in and out of the cell


Moving things in is called endocytosis

Moving things out is called exocytosis

If the particle is a solid its called phagocytosis

If the particle is a liquid droplet its called pinocytosis

 <http://www.youtube.com/watch?v=HndmASfml8Y>

 <http://www.youtube.com/watch?v=4gLtk8Yc1Zc>

Analyzing Data

Do # 1 and 2 page 188

Test Items

1. Characteristics of Living Things
2. Abiogenesis / Spontaneous generation
(experiments performed by 4 scientists)
3. Cell Theory - timeline with 5
scientists
4. Cell diagram part (jobs)
5. Microscope & how it works
6. Cell membrane-passive &
active transport

Review Questions

Page 197

1 to 8,12,14, 15, 16,19, 20,21, 22, 23,